

IN THE CLAIMS

1-9 (cancelled)

10. (amended) An apparatus for performing acoustic investigations while drilling of a subsurface geological formation penetrated by a borehole in a subsurface geological formation, comprising:

- (a) a longitudinally extending body conveyed in said borehole on a drilling tubular, said body and said drilling tubular having a drilling fluid flowing therethrough;
- (b) an acoustic transmitter supported by the body, said transmitter generating acoustic signals in the body, the borehole and the subsurface formation[s];
- (c) an acoustic receiver spaced apart from the transmitter and supported by the body for receiving said acoustic signals; and
- (d) an attenuator located on a substantially cylindrical portion of the body having an inner diameter and an outer diameter, between said acoustic transmitter and said acoustic receiver for attenuating said acoustic signals in the body within a predetermined frequency range;

wherein said attenuator comprises a plurality of spaced-apart masses having a predetermined spacing, mass and length firmly attached to an external surface of an outer wall of the cylindrical portion of the body.

11. (amended) The apparatus of claim 10 wherein the longitudinally extending body is conveyed on a drilling tubular having has a drill bit therein for drilling the borehole, said drilling tubular selected from the group consisting of (i) a drill string, and, (ii) coiled tubing.

12. (Original) The apparatus of claim 10 wherein the attenuator comprises a plurality of spaced apart masses wherein said predetermined frequency range comprises 10 khz to 20 khz.

13. (Original) The apparatus of claim 10 wherein the attenuator comprises a plurality of spaced apart masses wherein material of said masses is selected from the group consisting of (i) steel rings, and, (ii) tungsten rings.

14. (Original) The apparatus of claim 10 wherein the attenuator comprises a plurality of spaced apart masses wherein said plurality of masses is between six and ten.

15. (Original) The apparatus of claim 10 wherein the attenuator comprises a plurality of spaced apart masses and wherein said spacing of the masses is within the range of twelve to fourteen centimeters.

16. (amended) A method of performing acoustic investigations while drilling of a subsurface geological formation penetrated by a borehole, comprising:

- (a) conveying a logging tool having a substantially cylindrical body into the borehole on a drilling tubular, said body and said drilling tubular having a drilling fluid flowing therethrough;
- (b) activating a transmitter on the body for generating acoustic signals in the formation, borehole and the body;
- (c) attenuating signals passing through the body using an attenuator comprising a plurality of spaced-apart masses firmly attached on an external surface of an outside adjacent wall of the body, said masses being spaced apart a preselected distance to attenuate signals within a specified frequency range;

(d) using a receiver on a side of the attenuator opposite the transmitter for receiving signals through the formation and the attenuated signals through the body.

17. (Original) The method of claim 16 wherein said specified frequency range comprises 10 khz to 20 khz.

18. (Original) The method of claim 16 wherein said plurality of masses comprises a material selected from (i) steel rings, and, (ii) tungsten rings.

19. (cancelled)

20. (cancelled)

21-25 (cancelled)

26. (amended) A method of performing acoustic investigations while drilling of a subsurface geological formation penetrated by a borehole comprising:

- (a) conveying a measurement-while-drilling acoustic logging tool having a substantially cylindrical body into the borehole;
- (b) activating a transmitter on the body for generating acoustic signals in the formation, borehole and the body;
- (c) preferentially attenuating signals passing through the body in a predetermined direction using an attenuator comprising a plurality of asymmetrical spaced-apart masses firmly and asymmetrically attached on an external surface of an outside adjacent wall of the body, said masses being spaced apart a preselected distance to attenuate signals within a specified frequency range;

(d) using a receiver on a side of the attenuator opposite the transmitter for receiving signals through the formation and the attenuated signals through the body.

27. (Original) The method of claim 26 wherein said specified frequency range comprises 10 khz to 20 khz.

28. (Original) The method of claim 26 wherein said plurality of masses comprises a material selected from (i) steel rings, and, (ii) tungsten rings.

29. (Original) The method of claim 26 further comprising conveying the logging tool on a drilling tubular.

30. (cancelled)

31. (new) The apparatus of claim 10, wherein each of the plurality of masses comprises a ring having an inner diameter greater than an outer diameter of the body by a predetermined amount, and further comprising a neck element associated with each of said rings and firmly attaching each of said rings to said body.